

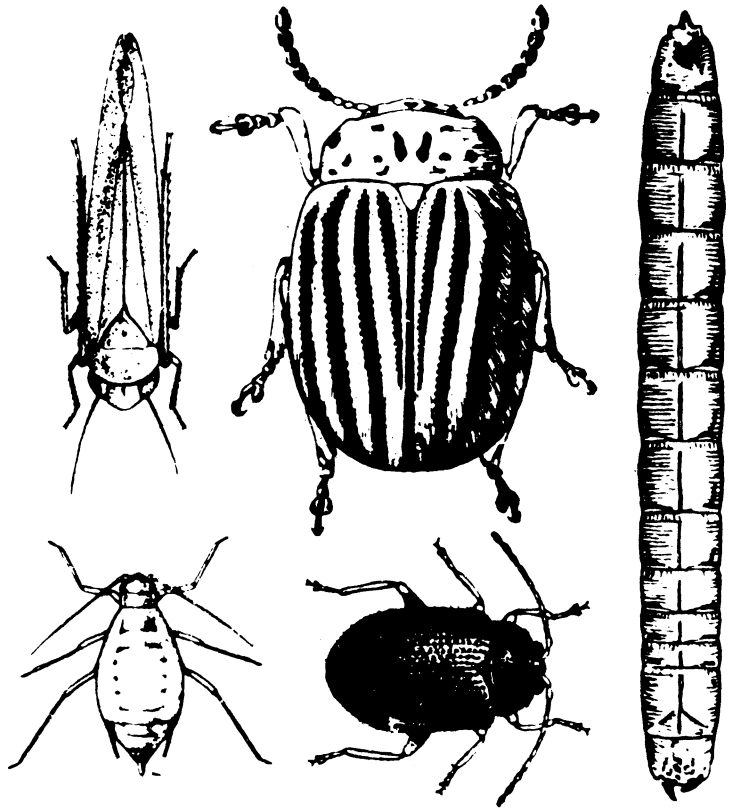
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**CONTROLLING**  
**POTATO**  
**INSECTS**



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This bulletin is addressed to commercial potato growers. Home gardeners should refer to Home and Garden Bulletin 46, "Insects and Diseases of Vegetables in the Home Garden," available for 30 cents from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402. Please include your ZIP Code in your return address.

For descriptions of insect pests of potatoes, and information on their biology and habits, send for Agriculture Handbook 264, "Potato Insects: Their Biology and Biological and Cultural Control." AH 264 is also available for 30 cents from the Superintendent of Documents.

If you need help in identifying the pests that are damaging your potatoes, or in selecting the proper insecticide, consult your county agricultural agent or Extension Service entomologist.



This edition incorporates changes in insecticide recommendations that make all previous editions obsolete. For this reason, all earlier copies should be destroyed.

Washington, D.C.

Revised January 1969

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# CONTROLLING POTATO INSECTS

By W. A. SHANDS, B. L. LANDIS, and W. J. REID, JR.,<sup>1</sup> *entomologists,*  
*Entomology Research Division, Agricultural Research Service*

Wherever potatoes are grown in the United States, the use of insecticide usually is necessary to protect the crop from damage by insects and related pests. Cultural and biological methods of control are of value but often must be supplemented with chemical controls.

No one insecticide will control all kinds of potato insects, and a given insecticide may be more effective in one area than in another. Select the proper dust, spray, or insecticide bait. Apply it carefully, at the right time, in the correct dosage.

Insecticides are applied to potato foliage to control some pests, but it may be necessary to apply them on the soil, in the soil, or on nearby vegetation to control other insects.

## SELECTING INSECTICIDES

The table beginning on page 9 lists kinds and amounts of insecticides to use to control potato insects. You generally can control insects on potatoes by applying dusts, sprays, or granules with ground equipment or aircraft. Insecticide baits are effective against some insects. Sprays are more practical than other formulations when it is necessary to control both insects and early or late blight. They are usually more effective than dusts and are less apt to drift to adjacent crops.

However, row-crop dusters compact the soil less than heavily loaded sprayers and are more convenient where water is not readily available.

If you spray, liquid concentrates are most satisfactory for use in all types of sprayers. Some paste-type concentrates and coarsely ground wettable powders may clog spray nozzles—especially when concentrate sprays are applied.

Thorough coverage of the foliage is desirable for many insecticides when applied in either dust or spray form. It is especially desirable if a fungicide is included for early or late blight. However, thorough coverage of the foliage is not necessary for endosulfan, for certain organophosphorous insecticides that kill by fumigation as well as by contact, or for systemic insecticides. You can control insects with aircraft, using as little as 5 to 8 gallons of spray, if you choose your insecticides carefully.

## USING INSECTICIDES

Foliage applications of endosulfan provide effective control of aphids and other insects, but several applications may be required during the season.

Systemic insecticides such as disulfoton and demeton have provided satisfactory control of aphids, cer-

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<sup>1</sup> *Retired.*

tain kinds of leafhoppers, the Colorado potato beetle, and the potato flea beetle, for long periods of time. One or two additional foliage applications of demeton may be required on table stock or seed potatoes grown in cooler sections of the country. Disulfoton granules or liquid concentrate applied in bands or in the furrow at planting time, or as postplanting sidedress applications, should control most of these insects for 6 to 10 weeks. They should also retard the spread of insect-borne virus diseases.

Keep close watch on the effectiveness of a systemic insecticide, and be ready to act if effectiveness is lost and insects require control. Consult your county agricultural agent or Extension Service entomologist for more information about the performance of various systemic insecticides on potatoes in your area.

Insecticide granules mixed with dry fertilizer tend to separate out and leave an uneven mixture. If a combination insecticide-fertilizer is to be used, obtain a product in which the insecticide has been sprayed onto the fertilizer.

Equipment for applying granules is available for mounting on the planter or tractor tool bar.

## **CARING FOR EQUIPMENT**

Before the growing season starts, carefully check your application equipment. See that it is in proper working order, and calibrate it so you can adjust it to apply the amount of insecticide mixture recommended.

Inspect your equipment frequently, to insure proper applica-

tion rates. Clean and adjust the spray or dust nozzles as often as necessary to maintain uniform delivery of the insecticide.

Make correction or replacement as soon as you detect any defect.

## **MIXING A SPRAY**

In preparing a spray, first refer to the table (pp. 9 to 16) and to the ingredient label on the insecticide package. Determine the quantity of stock insecticide (concentrate) to apply to each acre. Then multiply this figure by the number of acres to be treated with a tankful, or one spray mix. This will tell you the quantity of insecticide concentrate to use in each spray mix.

Weigh or measure the exact amount of insecticide concentrate to be put into each tankful of mixed spray. The strength of most emulsifiable concentrates is given as pounds of active ingredient per gallon, making it convenient to measure the amount needed. When only the percentage by weight is known, the concentrate should be weighed.

Mix the insecticide concentrate with water in the tank as it is being filled.

## **APPLYING A SPRAY**

If you are spraying with ground equipment at 200 to 400 pounds of pressure per square inch, use 75 to 150 gallons of spray per acre; or use 20 to 40 gallons per acre at 40 to 80 pounds pressure. If you are spraying with aircraft, use 5 to 8 gallons per acre.

Spray coverage is determined by the number, kind, and placement of

nozzles on the spray boom. Adjust nozzles so insecticide will reach and cover all infested parts of the plants.

Use three or four nozzles for each row. The hollow- or solid-cone type nozzle is preferable to the flat, fan type. Place two nozzles on "drop" pipes—one on each side of the row between the plants. Direct them slightly forward so they will deliver the spray to foliage of the lower leaves of the plants. Place one or two nozzles directed downward and slightly forward, to spray the upper halves of plants.

As the plants grow, adjust height of the spray boom upward and substitute longer pipes.

Best coverage can be achieved by using a trailing-boom type sprayer. This type of sprayer has a series of boomlets, each of which is mounted on a metal shoe that slides on the surface of the soil between two rows. Each boomlet has several nozzles, some of which are directed downward and out from the top, and others upward and out from the bottom. Specially designed vine lifters raise the vines and allow insecticide to be directed to the undersides of leaves.

To be most effective, insecticides—especially endosulfan—must be applied when there is as little air movement as possible and when warm temperatures prevail.

## APPLYING A DUST

If you use ground equipment, apply 25 to 35 pounds of dust per acre. If you use aircraft, apply 30 to 35 pounds of dust per acre. Adjust the dosage and the equipment so you do not exceed the amount of active ingredient per acre listed in the table (pp. 9 to 16).

Row-crop dusters require at least two nozzles per row for efficient coverage. In some cases three nozzles are preferable—one for each side of the row, and one to deliver dust from above.

If wind velocity is a problem, attach a trailing apron 8 to 15 feet long to the duster boom. It can be made of 9-ounce cotton ducking. When the duster moves at 3 to 4 miles an hour, the apron will confine the dust long enough to insure coverage of foliage. The apron will remain spread out over the plants during dusting if you weight its outer rim with a rope.



TC-7307

Tractor-mounted dust applicator equipped with a trailing apron to reduce drift of insecticide.





1943B53

Chisel-type applicators for injecting fumigants into the soil for control of wireworms and symphylans.

## TIMING APPLICATIONS

You can save time, effort, and money by properly timing your applications. If the insects that attack your crops occur each year, apply insecticide before damaging infestations have had a chance to develop.

In many instances it is not possible to forecast insect outbreaks. Then, you should apply insecticide as soon as possible after infestation or damage is detected. It is important to make frequent inspections.

A few properly timed applications of an insecticide may control some pests as effectively as weekly applications made throughout the season. During some years, the kinds of pests may change as the season advances, and additional applications of the same or different insecticide must be used.

Early, repeated applications help prevent development of damaging numbers of disease-carrying insects

such as aphids. In the Northeast, best control of insects that spread virus diseases is obtained by following a schedule of rather frequent applications to the foliage early in the season. In the Northwest, effective control is usually achieved by spreading the applications over the period of June 15 to August 1; or by applying granular disulfoton to the soil during or shortly after planting, and then applying endosulfan to the foliage as required later in the season.

Refer to the last column of the table to find the most effective schedules for various pests and for different parts of the United States.

## NONCHEMICAL CONTROLS

You may be able to lessen the need for insecticides by following good cultural practices. These consist primarily of measures you can take to discourage the breeding and development of insect pests. Avoid

practices that might destroy predators, parasites, or diseases that kill harmful insects.

The value of cultural and natural controls will depend on local conditions. Consult your extension entomologist or county agricultural agent for suggestions.

### Cultural Controls

*Aphids.*—To control aphids, it is helpful to destroy their weed hosts: wild mustard, wild rutabaga, wild radish, hemp nettle, smartweed, and lambsquarters, for example. It is especially important to prevent weeds from developing during early spring in potato fields, and in adjacent fallow fields and untilled areas. While destruction of host plants will not eliminate the need for insecticides, it will help reduce aphid populations to more manageable levels.

*Seed-corn maggot.*—In areas where the seed-corn maggot is likely to cause serious damage to planted seed pieces, avoid planting potatoes in soil that contains large quantities of partly decayed crop residues. If you use organic fertilizers, mix them promptly and thoroughly into the soil.

If these precautions cannot be followed, be sure that the cut surfaces of potato seed-pieces are well healed before they are planted, or that they are planted when soil conditions are likely to be favorable for rapid healing of the cut seed. (Seed-corn maggots will not feed on sound, well-healed seed-pieces.) The temperature in the storage room or in

the soil should be approximately 60° to 70° F., and the relative humidity 85 to 95 percent, for at least a week after the seed are cut.

*Virus diseases.*—To control virus diseases that attack potatoes, it is necessary to combine good cultural practices with the use of insecticides. Insecticides control the insects that spread the diseases; cultural practices eliminate the diseased plants that could be a source of further virus infection.

To successfully produce potatoes either for table use or for seed, plant virus-free stock, or tubers that are very low in virus content. Then, control the insects that spread virus diseases (aphids and leafhoppers, chiefly). This is particularly important if you are growing potatoes for seed. Seed potatoes must be protected throughout the season from infection with any of the several virus diseases carried by insects.

Pull up and destroy all diseased potato plants as they become evident—especially in fields of seed potatoes. Do this early in the season, before they serve as sources from which insects may spread virus diseases to healthy plants.

Many varieties of potatoes grown for table use can tolerate virus infections, as well as moderate injury from chewing insects, without appreciable loss in yield or quality. However, leaf roll disease during the year of infection causes objectionable internal discoloration of the tubers of some potato varieties (including Russet Burbank and Green Mountain), and in some areas seriously lowers yield.



## Natural Controls

Natural controls frequently hold down insect populations on potatoes. The most important of these controls are parasitic and predatory insects, fungus diseases, and certain weather conditions. Aphids are particularly subject to these natural controls.

The most important parasites of aphids are several kinds of tiny wasplike insects that lay eggs inside the aphids. The eggs hatch into larvae that devour the insides of the aphids' bodies.

Both larvae and adults of lady beetles are important predators. They eat large numbers of aphids. Other predatory insects that feed on aphids are spiders, soldier bugs, assassin bugs, syrphid flies, and lacewing flies.

Parasites and predators of harmful insects are often killed by insecticides. Protect them when possible. Do not apply insecticides unnecessarily. Do not use excessive quantities of insecticides. Choose the insecticides that are least harmful to beneficial insects.

## PRECAUTIONS

Insecticides used improperly can be injurious to man and animals. Use them only when needed and handle them with care. Follow the directions and heed all precautions on the labels.

Some States have special restrictions on the use of certain insecticides. Before applying insecticides, check State and local regulations.

Keep insecticides in closed, well-labeled containers in a dry place. Store them where they will not contaminate food or feed, and where children and animals cannot reach them. Promptly dispose of empty insecticide containers; do not use for any other purpose.

When handling an insecticide, wear clean, dry clothing.

Avoid repeated or prolonged contact of insecticide with your skin.

Wear protective clothing and equipment if specified on the container label. Avoid prolonged inhalation of insecticide dusts or mists.

Avoid spilling an insecticide on the skin, and keep it out of the eyes, nose, and mouth. If you spill any on your skin or clothing, remove contaminated clothing immediately and wash the skin thoroughly with soap and water. Launder clothing before wearing it again. If the insecticide gets in the eyes, flush with plenty of water for 5 minutes and get medical attention.

Chlordane, diazinon, dieldrin, endosulfan, and naled can be absorbed directly through the skin in harmful quantities. When working with these insecticides in any form, take extra care not to let them come in contact with the skin.

Carbophenothion, dichloropropane-dichloropropene, demeton, disulfoton, azinphosmethyl, parathion, and Telone are highly toxic and may be fatal if swallowed, inhaled, or absorbed through the skin. Reduce the danger of skin exposure by wearing protective clothing and respiratory devices as specified on container labels. These insecticides should be applied only by a person who is thoroughly familiar with their hazards, who will assume full responsibility for safe use, and who will comply with all precautions on the labels.

Keep all persons and animals off areas where soil has been treated with parathion, for at least 48 hours.

Do not transfer ethylene dibromide, Telone, or dichloropropane-dichloropropene mixture from one container to another in a closed room. Do not breathe the fumes.

Do not feed tubers from fields treated with chlordane, dieldrin, DDT, or endosulfan, to dairy animals or to animals being finished for slaughter.

Avoid drift of insecticide to nearby wildlife habitats, bee yards, crops, or livestock. Do not apply insecticides under conditions favoring drift from the area to be treated.

Many insecticides are highly toxic to fish and aquatic animals. Keep insecticides out of all water sources such as ponds, streams, and wells. Do not clean spraying equipment or dump excess spray material near such water.

Do not apply insecticides to plants during hours when honey bees and other pollinating insects are visiting them.

Dispose of empty insecticide containers at a sanitary land-fill dump, or crush and bury them at least 18 inches deep in a level, isolated place where they will not contaminate water supplies.

# *Insecticide Recommendations for Control of Insects on Potatoes*

Insect, and section of U.S.	Insecticide	Formulation <sup>1</sup>	Pounds of active ingredient to apply per acre <sup>2</sup>	When and where to apply <sup>3</sup>
APHIDS: Northeastern quarter of U.S.	Endosulfan.....	EC or WP.....	0.5.....	Apply to foliage during last half of July, and repeat if needed. Do not apply endosulfan except in warm, relatively calm weather.
	Malathion.....	EC or WP.....	0.5.....	
	Parathion.....	D, EC, WP.....	0.3.....	
	Disulfoton <sup>4</sup> .....	G.....	2.0.....	Apply in fertilizer band or in planting furrow with special applicator attached to planter.
Southeastern quarter of U.S.	Diazinon.....	D.....	1.0.....	Apply to foliage weekly as needed.
	Endosulfan.....	EC or WP.....	0.5.....	
		D or WP.....	1.5.....	Apply in furrow as side dressing at planting time.
	Parathion.....	EC.....	1.0.....	
	Disulfoton <sup>4</sup> .....	D, EC, or WP.....	0.5.....	
Northwestern and Southwestern quarters of U.S.		G.....	3.0.....	In Northwest, apply demeton or endosulfan to foliage of seed crop when aphids appear. Apply endosulfan to table crop June 15 and repeat every 10-12 days, to at least August 1. In Southwest, apply as needed. Endosulfan is more effective than demeton for aircraft application.
	Demeton.....	EC.....	0.5.....	
	Endosulfan.....	D or EC.....	1.0.....	

See footnotes on page 16.

***Insecticide Recommendations for Control of Insects on Potatoes—Continued***

Insect, and section of U.S.	Insecticide	Formulation <sup>1</sup>	Pounds of active ingredient to apply per acre <sup>2</sup>	When and where to apply <sup>3</sup>
	Disulfoton <sup>4</sup> -----	G-----	3.0-----	Apply to soil in bands on both sides of row at planting, except in long-season areas. In these areas, apply to early plantings as side dressing between May 1 and May 20, and follow with foliage applications of endosulfan as needed. Or consult local agricultural authority as to best time to apply.
ARMYWORMS: Where present-----	DDT-----	B, D, EC, or WP----	2.0-----	Apply the spray or dust, or broadcast the bait, on nearby vegetation before armyworms reach potato fields. Do not feed treated plants to poultry, dairy animals, or animals being finished for slaughter.
BLISTER BEETLES: Where present-----	DDT----- Naled----- Parathion-----	D or WP----- EC----- D or EC----- D, EC, or WP----	2.0----- 1.0----- 1.0----- 0.5-----	Dust or spray the beetles when present in damaging numbers. They usually occur in small sections of field; treat infested areas quickly, to prevent the spread of beetles.
COLORADO POTATO BEETLE: Northeastern quarter of U.S.	Azinphosmethyl----- Carbaryl-----	EC----- WP-----	0.5----- 0.8-----	On foliage when 25 percent of stand is present, and again after 7 days.

Southeastern quarter of U.S.	Carbaryl.....	D or WP.....	2.0.....	On foliage when eggs begin to hatch. Repeat as needed.
	Endosulfan.....	D, EC, or WP.....	1.0.....	
	Naled.....	D or EC.....	1.0.....	
	Carbaryl.....	D.....	1.5.....	On foliage when beetles become abundant, or shortly after eggs hatch
Northwestern and Southwestern quarters of U.S.	Endosulfan.....	D or EC.....	1.0.....	and, if needed, after 10 to 14 days. Apply in bands or as a side dressing in May. Do not apply within 75 days before harvest.
	Disulfoton.....	G.....	3.0.....	
CUCUMBER BEETLES (Adults): Where present.....	Carbaryl.....	D or WP.....	1.0.....	On foliage as needed.
	DDT.....	D or WP.....	1.5.....	
		EC.....	1.0.....	
CUTWORMS: Where present.....	DDT <sup>6</sup> .....	D, G, or WP.....	2.0.....	To soil surface and foliage when cut- worms first appear.
		EC.....	1.0.....	
EUROPEAN CORN BORER: Where present.....	DDT.....	D.....	2.0.....	On foliage as needed. In New England, apply each week of June and August.
		EC.....	0.4.....	
		WP.....	1.5.....	
FALSE CHINCH BUG: Where present.....	Endosulfan.....	EC.....	1.0.....	On foliage of infested plants.
	Malathion.....	D, EC, or WP.....	1.0.....	
FLEA BEETLES (Adults): Where present.....	Carbaryl.....	D or WP.....	0.8.....	On foliage. In Southeast, as needed; elsewhere, when 25 percent of stand is present and 7 days later.
	DDT <sup>5</sup> .....	EC.....	1.0.....	
		D or WP.....	1.5.....	
	Dieldrin <sup>5</sup> .....	D, EC, or WP.....	0.5.....	
	Endosulfan <sup>5</sup> .....	D or EC.....	1.0.....	
GARDEN SYMPHYLAN: Northwestern quarter of U.S.	Parathion.....	EC or WP.....	5.0.....	Broadcast on soil before planting and immediately work thoroughly into upper 6 inches.

See footnotes on page 16.

# *Insecticide Recommendations for Control of Insects on Potatoes—Continued*

Insect, and section of U.S.	Insecticide	Formulation <sup>1</sup>	Pounds of active ingredient to apply per acre <sup>2</sup>	When and where to apply <sup>3</sup>
	Dichloropropane-dichloropropene mixture. Telone	Liquid fumigant	300	Apply with chisel applicator. Follow with ring roller or smyzer. Do not plant within 3 weeks. Soil temperatures should be above 40° F.
GRASSHOPPERS: Where present	Malathion	Liquid fumigant EC or WP	300 0.8	To nearby vegetation before insects reach potato fields; repeat as needed. Do not feed treated plants to poultry, dairy animals, or animals being finished for slaughter.
LEAFHOPPERS: Where present	DDT Endosulfan Malathion Methoxychlor Parathion Disulfoton	D or WP EC EC EC WP D, EC, or WP G	1.5 1.0 1.0 1.0 2.2 0.5 3.0	On foliage when leafhoppers first appear; repeat every 10 days as needed.
LEAF MINERS: Southeastern and Southwestern quarters of U.S.	Azinphosmethyl Diazinon Parathion	D EC or WP EC or WP D, EC, or WP	0.6 0.5 0.5 0.5	Apply in bands or as a side dressing before plants are 3 inches high. Do not apply within 75 days before harvest. On foliage as needed.

MILLIPEDES: Northwestern and Northeastern quarters of U.S.	DDT.....	D.....	3.0.....	On foliage or soil surface as needed.
MITES: Northwestern quarter of U.S. Where present.....	Carbophenothion.....	EC.....	1.0.....	On foliage as soon as mites appear.
	Dicofol.....	D or EC.....	1.0.....	
MOLE CRICKETS: Southeastern quarter of U.S.	Dicofol + sulfur.....	4% + 50%, D.....	1.4 + 18.....	
	Parathion + sulfur.....	2% + 50%, D.....	0.7 + 18.....	
	Chlordane.....	D, EC, G, or WP.....	2.0 <sup>7</sup> .....	Broadcast on soil surface before plant-
	Diazinon.....	EC, G, or WP.....	3.0.....	ing.
PLANT BUGS (including shield-shaped bugs): Where present.....	DDT.....	D or WP.....	2.0.....	On foliage as needed.
	Endosulfan.....	EC.....	1.0.....	
	Parathion.....	D, EC, or WP.....	0.5.....	
	Disulfoton.....	G.....	3.0.....	Apply to soil in bands on both sides of row at planting time.
POTATO PSYLLID: Where present.....				
	DDT.....	D.....	1.7.....	On foliage when 1 adult is found per 100 sweeps. Repeat every 2 weeks, 4 or 5 times.
POTATO TUBERWORM: In field in Southwestern and Southeastern quarters of U.S.	Parathion.....	EC or WP.....	1.0.....	
		D.....	0.5.....	
	Azinphosmethyl.....	D, EC, or WP.....	0.5.....	On foliage when tuberworms begin to web leaves together. Repeat in 10 days.
	DDT.....	EC.....	1.0.....	
SLUGS: Where present.....	Endosulfan.....	D or EC.....	1.0.....	
	Metaldehyde + chlordane.....	2½% + 5%, B.....	0.25 + 0.5.....	Broadcast on soil late in day when damage is observed.

See footnotes on page 16.

# *Insecticide Recommendations for Control of Insects on Potatoes—Continued*

Insect, and section of U.S.	Insecticide	Formulation <sup>1</sup>	Pounds of active ingredient to apply per acre <sup>2</sup>	When and where to apply <sup>3</sup>
SOUTHERN POTATO WIREWORM: Southeastern quarter of U.S.	Diazinon.....	EC, G, or WP.....	2.0.....	Broadcast on soil and immediately work thoroughly into upper 4 to 6 inches with double-disk harrow. Consult local agricultural authority as to best time to apply. If soil is to be turned to a depth of more than 6 inches, apply either 3 weeks before plowing or wait until soil has settled.
	Parathion.....	EC, G, or WP.....	3.0.....	
THREE-LINED POTATO BEETLE: Northeastern quarter of U.S.	Carbaryl.....	EC.....	0.5.....	On foliage as needed.
	DDT.....	D or WP.....	2.0.....	
	EC.....	EC.....	1.0.....	
	Endosulfan.....	EC.....	0.5.....	
THRIPS: Where present.....	DDT.....	D.....	1.5.....	On foliage as needed.
	EC.....	EC.....	1.0.....	
	Endosulfan.....	EC or D.....	1.0.....	
	Parathion.....	D, EC, or WP.....	0.5.....	
VEGETABLE WEEVIL: Southeastern and Southwestern quarters of U.S.	DDT.....	D or WP.....	1.5.....	On foliage as needed.
	EC.....	EC.....	0.75.....	
	Dieldrin.....	D, EC, or WP.....	0.5.....	
	Parathion.....	D, EC, or WP.....	0.5.....	



<b>WHITEFLIES:</b> Where present.....	DDT.....	D or WP.....	1. 5.....	On foliage when adults become abundant.
	Endosulfan.....	EC..... EC.....	1. 0..... 1. 0.....	
<b>WHITE-FRINGED BEETLE GRUBS:</b> Where present.....	Chlordane..... DDT.....	EC, G, or WP..... EC, G, or WP.....	5. 0 <sup>7</sup> ..... 10. 0 <sup>7</sup> .....	Broadcast on soil when preparing for planting and thoroughly work into upper 3 inches.
<b>WHITE GRUBS:</b> Where present.....	Chlordane..... DDT.....	EC, G, or WP..... EC, G, or WP.....	10. 0 <sup>7</sup> ..... 10. 0 <sup>7</sup> .....	To soil surface before planting; thoroughly work into upper 4 to 6 inches.
<b>WIREWORMS:</b> Northeastern quarter of U.S.	Chlordane..... Diazinon <sup>6</sup> .....	EC, G, or WP..... EC, G, or WP.....	8. 0 <sup>7</sup> ..... 2. 0.....	Broadcast on soil before planting; thoroughly work into upper 4 to 6 inches.
Southeastern quarter of U.S. <sup>8</sup>	Chlordane <sup>5</sup> .....	EC, G, or WP.....	8. 0 <sup>7</sup> .....	Broadcast on soil before planting and immediately work it thoroughly into the upper 4 to 6 inches.
Northwestern quarter of U.S.	DDT..... Diazinon..... Parathion.....	EC, G, or WP..... G..... G.....	10. 0 <sup>7</sup> ..... 4. 0..... 4 to 6.....	Broadcast on soil and immediately work it thoroughly into the upper 6 to 9 inches. Do not treat before April 1, before soil to be treated is 50° F., or later than August, for control the following year.
	Dichloropropane- dichloropropene mixture.	Liquid fumigant.....	250.....	Apply these fumigants undiluted, or mix fuel oil with ethylene dibromide to meet equipment requirements.
	Ethylene dibromide..... Telone.....	83% solution..... Liquid fumigant.....	36..... 200.....	Apply 8 to 9 inches deep with chisel applicator; compact with ring roller or smyzer. Soil temperature should be at least 50° F.

See footnotes on page 16.

# *Insecticide Recommendations for Control of Insects on Potatoes—Continued*

Insect, and section of U.S.	Insecticide	Formulation <sup>1</sup>	Pounds of active ingredient to apply per acre <sup>2</sup>	When and where to apply <sup>3</sup>
Southwestern quarter of U.S.	DDT-----	EC-----	10.0 <sup>7</sup> -----	Apply 6 months before planting. Disk into soil 4 to 6 inches deep. Apply once during a 5-year period. Not effective on peat soils.
	Ethylene dibromide-----	83% solution-----	36-----	Inject 8 inches deep in fallow soil every 12 inches. Apply at least 3 weeks before planting.

<sup>1</sup> B = bait; D = dust; EC = emulsifiable concentrate; G = granules; WP = wettable powder.

<sup>2</sup> Maximum dosage, unless range is indicated. Lower dosages may be effective under some local conditions. Consult your extension entomologist or county agricultural agent.

<sup>3</sup> Do not apply disulfoton within 75 days, demeton within 21 days, diazinon within 14 days, azinphosmethyl within 7 days, parathion within 5 days, or dieldrin within 3 days before harvest.

<sup>4</sup> Observations toward the end of the season may show need for supplemental applications of other insecticides in some areas.

<sup>5</sup> Not effective in some sections.

<sup>6</sup> Not effective against some species of cutworms.

<sup>7</sup> Do not repeat applications at this dosage for at least 3 years.

<sup>8</sup> The southern potato wireworm is the predominant pest species on potatoes in the Southeast. See page 14 for control recommendations.

Trade names are used in this publication solely for the purpose of providing specific information. Mention of a trade name does not constitute a guarantee or warranty of the product by the U.S. Department of Agriculture, or an endorsement by the Department over other products not mentioned.